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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,732	10/17/2003	Myung Seop Kim	K-0546	8331

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EXAMINER	
LEURIG, SHARLENE L	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/686,732	KIM ET AL.	
	Examiner	Art Unit	
	Sharlene Leurig	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-17 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-17 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 6, 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record).

Kido discloses an electroluminescent device having a substrate (1) and at least one organic luminous layer and at least one carrier-transporting layer sandwiched between a transparent electrode and a backside electrode (paragraph 0012), in which a liquid crystal is disposed in the organic luminous layer or the carrier-transporting layer or both, or adjacent one of those layers (paragraphs 0012-0014 and 0050). The electroluminescent layers of the device may be of the conventional type (paragraph 0010). Kido discloses an embodiment in which both electrodes are formed of ITO (Figure 4).

Kido fails to exemplify a multilayer transparent electrode.

Regarding claim 1, Sato teaches a liquid crystal device having a top electrode that comprises a stack of transparent thin film (Figure 1, element 2) and metal layers (5). Sato teaches such an electrode as resolving problems exhibited by an electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as

enabling large displays by reducing cross-talk between electrodes (paragraph 0003). The stacked electrode of Sato comprises a first layer of metal and a second layer of transparent material stacked alternately, wherein the electrode comprises two or more sets of the first layer and second layer stacked alternately, with each set of the first and second layers formed directly on an adjacent set of first and second layers (Figure 1).

Regarding claim 6, Sato teaches a first metal layer of silver and a second transparent layer of ITO (paragraph 0006).

Regarding claim 7, the transparent thin film layer of the second electrode taught by Sato includes 1-100 layers in total.

Therefore regarding claims 1, 6 and 7, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other and having the structure and materials taught by Sato in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato.

Regarding claim 2, Kido discloses a first electrode of ITO (Figure 1).

Regarding claim 21, Sato teaches a seven-layer stack, but fails to exemplify a total number of first and second layers in the sets being ten.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an additional Ag-ITO-Ag set to the stack to provide ten layers, since it has been held that mere duplication of the essential working parts of a

device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.,* 193 USPQ 8.

Therefore regarding claim 21, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other and having the structure and materials taught by Sato in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, and to further modify the stack to include 10 layers to acquire a given permeability and resistance, as it has been held to require only routine skill to apply such an adaptation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record) as applied to claims 1, 2, 6, 7 and 21 above, and further in view of applicant's admission of the prior art.

Kido discloses an organic electroluminescent display device further containing liquid crystal material. The emitting layer is an organic electroluminescent layer, and the device may further contain both hole and electron transport layers (paragraph 0036).

Kido fails to exemplify a multilayer transparent electrode.

Sato teaches a liquid crystal device having a top electrode that comprises a stack of sets of transparent thin film (Figure 1, element 2) and metal layers (5) that are alternately stacked to form a set, wherein each individual set is formed directly on an adjacent set. Sato teaches such an electrode as resolving problems exhibited by an electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as enabling large displays by reducing cross-talk between electrodes (paragraph 0003).

Neither Kido nor Sato discloses separate hole injecting and electron injecting layers.

The applicant's admission of the prior art teaches an OLED having a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer formed on the first electrode in succession.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, and to further modify the device of Kido to have a stack of a hole injecting layer, a hole

transport layer, an emitting layer, an electron transport layer, and an electron injecting layer in order to improve the performance of the device by providing specialized layers, as the applicant's admission of the prior art has taught those layers to be well known.

5. Claims 8, 11, 12, 14, 15, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record) as applied to claims 1, 2, 6, 7 and 21 above, and further in view of Graff et al. (6,522,067) (of record).

Kido discloses an electroluminescent device having a substrate (1) and at least one organic luminous layer and at least one carrier-transporting layer sandwiched between a transparent electrode and a backside electrode (paragraph 0012), in which a liquid crystal is disposed in the organic luminous layer or the carrier-transporting layer or both, or adjacent one of those layers (paragraphs 0012-0014 and 0050). The electroluminescent layers of the device may be of the conventional type (paragraph 0010). Kido discloses an embodiment in which both electrodes are formed of ITO (Figure 4). Kido further discloses a protective glass or metal sheet being formed as part of the device (paragraph 0035).

Kido fails to exemplify a multilayer transparent electrode.

Sato teaches a liquid crystal device having a top electrode that comprises a stack of sets of transparent thin film (Figure 1, element 2) and metal layers (5) that are alternately stacked to form a set, wherein each individual set is formed directly on an adjacent set. Sato teaches such an electrode as resolving problems exhibited by an

electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as enabling large displays by reducing cross-talk between electrodes (paragraph 0003).

Neither Kido nor Sato discloses a protective film of a transparent thin film.

Graff teaches an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17).

Regarding claim 14, Sato teaches a first metal layer of silver and a second transparent layer of ITO (paragraph 0006).

Regarding claim 15, the transparent thin film layer of the second electrode taught by Sato includes 1-100 layers in total.

Therefore regarding claims 8, 11, 14, 15 and 20, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, and to further modify the device of Kido to have a protective film formed on the second electrode of a set of transparent thin films in order to protect the device from degradation due to moisture and oxygen, as taught by Graff.

Regarding claim 12, Kido discloses a first electrode of ITO (Figure 1).

Regarding claims 22 and 23, Sato teaches a seven-layer stack, but fails to exemplify a total number of first and second layers in the sets being ten.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an additional Ag-ITO-Ag set to the stack to provide ten layers, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.,* 193 USPQ 8.

Therefore regarding claims 22 and 23, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other and having the structure and materials taught by Sato in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, to further modify the device to have a protective film formed on the second electrode of a set of transparent thin films in order to protect the device from degradation due to moisture and oxygen, as taught by Graff, and to further modify the stack to include 10 layers to acquire a given permeability and resistance, as it has been held to require only routine skill to apply such an adaptation.

6. Claims 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record) and further in view of Graff et al. (6,522,067) (of record), as applied to claims 8, 11, 12, 14,

15, 20, 22 and 23 above, and further in view of Kubota et al. (US 2002/0113241 A1) (of record).

Kido discloses an organic electroluminescent display device further containing liquid crystal material. The emitting layer is an organic electroluminescent layer, and the device may further contain both hole and electron transport layers (paragraph 0036). Kido further discloses a protective glass or metal sheet being formed as part of the device (paragraph 0035).

Kido fails to exemplify a multilayer transparent electrode.

Sato teaches a liquid crystal device having a top electrode that comprises a stack of sets of transparent thin film (Figure 1, element 2) and metal layers (5) that are alternately stacked to form a set, wherein each individual set is formed directly on an adjacent set. Sato teaches such an electrode as resolving problems exhibited by an electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as enabling large displays by reducing cross-talk between electrodes (paragraph 0003).

Neither Kido nor Sato discloses a protective film of a transparent thin film.

Graff teaches an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17).

Graff fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Therefore regarding claims 9 and 16, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, to further modify the device of Kido to have a protective film formed on the second electrode of a set of transparent thin films in order to protect the device from degradation due to moisture and oxygen, as taught by Graff, and to further modify the OLED to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation.

7. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record), further in view of Graff et al. (6,522,067) (of record), further in view of Kubota et al. (US 2002/0113241 A1) (of record), as applied to claims 9 and 16 above, and further in view of Uchida et al. (5,912,061) (of record).

Kido discloses an organic electroluminescent display device further containing liquid crystal material. The emitting layer is an organic electroluminescent layer, and the device may further contain both hole and electron transport layers (paragraph 0036). Kido further discloses a protective glass or metal sheet being formed as part of the device (paragraph 0035).

Kido fails to exemplify a multilayer transparent electrode.

Sato teaches a liquid crystal device having a top electrode that comprises a stack of sets of transparent thin film (Figure 1, element 2) and metal layers (5) that are alternately stacked to form a set, wherein each individual set is formed directly on an adjacent set. Sato teaches such an electrode as resolving problems exhibited by an electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as enabling large displays by reducing cross-talk between electrodes (paragraph 0003).

Neither Kido nor Sato discloses a protective film of a transparent thin film.

Graff teaches an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17).

Graff fails to exemplify a protection layer having four layers in total.

Kubota teaches a light emitting device having a final protective layer encapsulating the entire device, where the final layer is formed of a fluoride containing polymer, which has very high water vapor barrier properties (paragraph 0096).

Graff further fails to exemplify the types of acrylate polymers that can be used for the polymer layers of the protective film.

Uchida teaches acrylate polymers used as protective coatings including a silicon compound of an acryl group, silicon acrylate (column 9, line 34) and many other types of acrylate, including stearyl acrylate (column 9, line 53).

Therefore regarding claims 10 and 17, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, to further modify the device of Kido to have a protective film formed on the second electrode of a set of transparent thin films in order to protect the device from degradation due to moisture and oxygen, as taught by Graff, to further modify the OLED to have a final and fourth layer of the protection layer formed of a fluoride polymer, as Kubota has taught that such a layer has very high moisture barrier properties, in order to further protect the device from elemental degradation, and to use stearyl acrylate for the first polymer layer over the second electrode and silicon acrylate for the third polymer layer, as Uchida has taught these acrylates as having good protective qualities.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kido et al. (US 2004/0043252 A1) in view of Sato et al. (JP 09-281517) (of record) and further

in view of Graff et al. (6,522,067) (of record) as applied to claims 8, 11, 12, 14, 15, 20, 22 and 23 above, and further in view of applicant's admission of the prior art.

Kido discloses an organic electroluminescent display device further containing liquid crystal material. The emitting layer is an organic electroluminescent layer, and the device may further contain both hole and electron transport layers (paragraph 0036).

Kido fails to exemplify a multilayer transparent electrode.

Sato teaches a liquid crystal device having a top electrode that comprises a stack of sets of transparent thin film (Figure 1, element 2) and metal layers (5) that are alternately stacked to form a set, wherein each individual set is formed directly on an adjacent set. Sato teaches such an electrode as resolving problems exhibited by an electrode made of a single ITO layer, as that of Kido, such as low magnetic permeability, and as enabling large displays by reducing cross-talk between electrodes (paragraph 0003).

Neither Kido nor Sato discloses a protective film of a transparent thin film.

Graff teaches an OLED having a protection film formed over the second electrode, including three layers in an acrylate polymer-silicon nitride barrier-acrylate polymer sequence in order to protect the device from degradation due to moisture and oxygen (column 2, lines 28-34; column 2, lines 9-17).

Kido, Sato and Graff fail to disclose separate hole injecting and electron injecting layers.

The applicant's admission of the prior art teaches an OLED having a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer formed on the first electrode in succession.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify one of the electrodes of Sato to be formed of a stack of first metal layers and second transparent layers stacked alternately and directly atop each other in order to provide an electrode of low resistance and high magnetic permeability that reduces cross-talk and enables large liquid crystal displays, as taught by Sato, to further modify the device of Kido to have a protective film formed on the second electrode of a set of transparent thin films in order to protect the device from degradation due to moisture and oxygen, as taught by Graff, and to further modify the device of Kido to have a stack of a hole injecting layer, a hole transport layer, an emitting layer, an electron transport layer, and an electron injecting layer in order to improve the performance of the device by providing specialized layers, as the applicant's admission of the prior art has taught those layers to be well known.

Response to Arguments

9. Applicant's arguments with respect to claims 1-3, 6-17 and 20-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sll

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